

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO R5- 2009-_____

MONITORING AND REPORTING PROGRAM
FOR
NORCAL WASTE SYSTEMS OSTROM ROAD LANDFILL, INCORPORATED
OSTROM ROAD LANDFILL
CLASS II LANDFILL, CLASS II SURFACE IMPOUNDMENT,
AND CLASS II LAND TREATMENT UNIT
CONSTRUCTION, OPERATION, POST-CLOSURE MAINTENANCE,
AND CORRECTIVE ACTION
YUBA COUNTY

The Discharger shall comply with this Monitoring and Reporting Program, with Title 27, California Code of Regulations, Section 20005, et seq. (hereafter Title 27), and with the *Standard Provisions and Reporting Requirements for Waste Discharge Requirements for Nonhazardous Solid Waste Discharges Regulated by Title 27 and/or Subtitle D (27 CCR §20005 et seq. and 40 CFR 258)*, dated April 2000, as ordered by Waste Discharge Requirements Order No. R5-2009-_____.

A. REQUIRED MONITORING REPORTS

<u>Report</u>	<u>Due</u>
1. Groundwater Monitoring (Section D.1)	See Tables I-A, 1-C
2. Unsaturated Zone Monitoring (Section D.2)	See Table II
3. Landfill Gas Monitoring (Section D.3)	See Table III
4. Leachate Monitoring/Seeps (Section D.4)	See Table IV
5. Leak Detection Monitoring(Section D.5)	See Table V
6. Surface Water Monitoring (Section D.6)	See Table VI
7. Storm Water Monitoring (Section D.7)	See Table VI
8. Semi-solid Waste Monitoring (Section D.8)	See Table VII
9. Facility Monitoring (Section D.9)	As necessary
10. Annual Monitoring Summary Report (Section E.5)	Annually
11. Response to a Release	As necessary
12. Water Quality Protection Standard Report	2009

B. REPORTING

The Discharger shall submit semiannual monitoring reports with the data and information required in this Monitoring and Reporting Program and as required in Order No. R5-2009-_____ and the Standard Provisions and Reporting Requirements, April 2000. Reports which do not comply with the required format will be **REJECTED** and the Discharger shall be deemed to be in noncompliance with the waste discharge requirements. In reporting the monitoring data required by this program, the Discharger shall arrange the data in tabular form so that the date, the constituents, the concentrations, and the units are readily discernible. The data shall be summarized in such a manner so as to illustrate clearly the compliance with waste discharge requirements or the lack thereof. Data shall also be submitted in a digital format acceptable to the Executive Officer.

Each monitoring report shall include a compliance evaluation summary as specified in Section E.3, below.

Field and laboratory tests shall be reported in each monitoring report. Monthly, quarterly, semiannual, and annual monitoring reports shall be submitted to the Regional Water Board in accordance with the following schedule for the calendar period in which samples were taken or observations made.

<u>Sampling Frequency</u>	<u>Reporting Frequency</u>	<u>Reporting Periods End</u>	<u>Report Date Due</u>
Monthly	Semiannually	Last Day of Month	by Semiannual Schedule
Quarterly	Semiannually	31 March	by Semiannual Schedule
		30 June	by Semiannual Schedule
		30 September	by Semiannual Schedule
		31 December	by Semiannual Schedule
Semiannually	Semiannually	30 June	31 July
		31 December	31 January
Annually	Annually	31 December	31 January
5-Year*	Every 5 years	31 December	31 January

* Last 5-year sampling was completed in 2006

The Discharger shall submit an **Annual Monitoring Summary Report** to the Regional Water Board covering the previous monitoring year. The annual report shall contain the information specified in E. Reporting Requirements, below, and a discussion of compliance with the waste discharge requirements and the Water Quality Protection Standard. The results of **all monitoring** conducted at the site shall reported to the Regional Water Board in accordance with the reporting schedule above for the calendar period in which samples were taken or observations made.

C. WATER QUALITY PROTECTION STANDARD AND COMPLIANCE PERIOD

1. Water Quality Protection Standard Report

For each waste management unit (Unit), the Water Quality Protection Standard shall consist of all constituents of concern, the concentration limit for each constituent of concern, the point of compliance, and all water quality monitoring points.

The Water Quality Protection Standard for naturally occurring waste constituents consists of the constituents of concern, the concentration limits, and the point of compliance and all monitoring points. The Water Quality Protection Standard, or any modification thereto, shall be submitted in a report for review and approval.

The report shall:

- a. Identify **all distinct bodies of surface and ground water** that could be affected in the event of a release from a Unit or portion of a Unit. This list shall include at least the uppermost aquifer and any permanent or ephemeral zones of perched groundwater underlying the facility.
- b. Include a map showing the monitoring points and background monitoring points for the surface water monitoring program, groundwater monitoring program, and the unsaturated zone monitoring program. The map shall include the point of compliance in accordance with Title 27 CCR Section 20405.
- c. Evaluate the perennial direction(s) of groundwater movement within the uppermost groundwater zone(s).

The Water Quality Protection Standard shall be certified by a California-registered civil engineer or geologist as meeting the requirements of Title 27. If subsequent sampling of the background monitoring point(s) indicates significant water quality changes due to either seasonal fluctuations or other reasons unrelated to waste management activities at the site, the Discharger may request modification of the Water Quality Protection Standard.

If subsequent sampling of the background monitoring point(s) indicates significant water quality changes due to either seasonal fluctuations or other reasons unrelated to waste management activities at the site, the Discharger may request modification of the Water Quality Protection Standard.

2. Constituents of Concern

The constituents of concern include all the waste constituents, their reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste contained in the Unit. The constituents of concern for all

Units at the facility are those listed in Tables I through VI for the specified monitored medium, and Table IX. The Discharger shall monitor all constituents of concern every five years, or more frequently as required.

The last 5-year Constituent-of-Concern (COC) monitoring event was conducted during 2006; therefore, the next COC event is scheduled to take place in 2011. The Discharger shall monitor all constituents of concern every five years, or more frequently as required in accordance with a Corrective Action Program.

a. Monitoring Parameters

Monitoring parameters are constituents of concern that are the waste constituents, reaction products, hazardous constituents, and physical parameters that provide a reliable indication of a release from a Unit. The monitoring parameters for all Units are those listed in Tables I through VI for the specified monitored medium.

3. Concentration Limits

For a naturally occurring constituent of concern, the detection monitoring and corrective action concentration limit for each constituent of concern shall be determined as follows:

- a. By calculation in accordance with a statistical method pursuant to §20415(e)(8) of Title 27; or
- b. By an alternate statistical method the requirements of §20415(e)(8) of Title 27.
- c. Concentration limits greater than background (CLGB) for corrective action may be proposed by the discharger in accordance with §20430 of Title 27 if, after proposed corrective action measures reveal that it is technically and economically infeasible to achieve background levels.

The Discharger shall establish concentration limits for the following monitored mediums as follows:

1. Unsaturated Zone – With the exception of VOCs and certain biosolids monitoring parameters (for which a non-statistical method is used to determine concentration limits), the concentration limits for COCs in the unsaturated zone shall be based on statistical evaluation of historical monitoring data for each monitoring point, as proposed by the Discharger. These concentration limits shall be updated annually and included in each monitoring report.
2. Groundwater - With the exception of VOCs (for which a non-statistical method is used to determine concentration limits), the concentration limits for groundwater monitoring shall be based on a statistical evaluation of

detection monitoring data.

- a. The Discharger uses inter-well statistical methods to evaluate groundwater quality in the detection monitoring wells. Under this approach, historical inorganic data are pooled from background monitoring wells to create a data set. The inter-well concentration limits are calculated using a tolerance limit method at 95% confidence and 95% coverage. The limits are updated annually. In this revised monitoring program, data from wells MW-1 and MW-3 will be pooled to create the background data set from which inter-well concentration limits are derived.
3. Surface Water – Concentration limits are calculated using the tolerance method based on historical data from upstream sampling location SW-1.

4. Point of Compliance

The point of compliance for the water standard at each Unit or portion of a Unit is a vertical surface located at the hydraulically down-gradient limit of the Unit that extends through the uppermost aquifer underlying the Unit. All point of compliance monitoring wells established for the detection monitoring program shall constitute the monitoring points for the groundwater Water Quality Protection Standard.

5. Compliance Period

The compliance period for each Unit shall be the number of years equal to the active life of the Unit plus the closure period. The compliance period is the minimum period during which the Discharger shall conduct a water quality monitoring program subsequent to a release from the Unit. The compliance period shall begin anew each time the Discharger initiates an evaluation monitoring program.

6. Due Date

The Water Quality Protection Standard Report is **due within 60 days of the date of this Order.**

D. MONITORING

The Discharger shall comply with the detection monitoring program provisions of Title 27 CCR for groundwater, surface water, and the unsaturated zone, in accordance with Detection Monitoring Specification E.2 and E.4 of Waste Discharge Requirements, Order No. R5-2009-____. Detection monitoring for a new Unit shall be installed, operational, and one year of monitoring data collected **prior to** the discharge of wastes. All monitoring shall be conducted in accordance with a Sample Collection and Analysis Plan, which include quality assurance/quality control standards, that shall

be submitted for review and approval.

All point of compliance monitoring wells established for the detection monitoring program shall constitute the monitoring points for the groundwater Water Quality Protection Standard. All detection monitoring and corrective action monitoring program groundwater monitoring wells, unsaturated zone monitoring devices, leachate, and surface water monitoring points shall be sampled and analyzed for monitoring parameters and constituents of concern as indicated and listed in Tables I through VI, and Table IX.

Method detection limits and practical quantitation limits shall be reported. All peaks shall be reported, including those which cannot be quantified and/or specifically identified. Metals shall be analyzed in accordance with the methods listed in Table VIII.

The Discharger may use alternative analytical test methods, including new USEPA approved methods, provided the methods have method detection limits equal to or lower than the analytical methods specified in this Monitoring and Reporting Program.

For any given monitored medium, a sufficient number of samples shall be taken from all Monitoring Points and Background Monitoring Points to satisfy the data analysis requirements for a given Reporting Period, and shall be taken in a manner that ensures sample independence to the greatest extent feasible. Collection of samples shall be in accordance with procedures set forth in a Sample Collection and Analysis Plan.

1. Groundwater

The Discharger shall operate and maintain a groundwater detection monitoring system that complies with the applicable provisions of Title 27 CCR Sections 20415 and 20420 in accordance with an approved Detection Monitoring Program. The detection monitoring system shall be certified by a California-licensed professional civil engineer or geologist as meeting the requirements of Title 27. The Discharger shall collect, preserve, and transport groundwater samples in accordance with an approved Sample Collection and Analysis Plan.

The monitoring well network (Attachment C) currently consists of background monitoring wells MW-1, MW-2 and MW-3, detection monitoring wells MW-4 through MW-8, MW-16, T-1, T-2, and corrective action Piezometers PZ-11, PZ-12, PZ-13 and any other monitoring points installed at the landfill. The piezometers were installed to monitor ephemerally perched water within the vadose zone north of Cells 1A and 2A as a part of the corrective action monitoring program. As the landfill expands, additional detection monitoring wells (MW-9 through MW-17) shall be installed at the approximate locations near the boundaries of the landfill as shown on Attachment C. In addition, interim monitoring wells shall be installed and monitored to provide the earliest possible detection of a release to groundwater. The wells are considered interim because they will be located within the permitted landfill footprint. As

new landfill cells are constructed, the wells shall be properly destroyed prior to landfill cell construction and only with Executive Officer review and approval. Detection monitoring well MW-4, MW-6 and MW-8 are currently interim monitoring wells located immediately downgradient of Cells 1A and 1B (Attachment C). Two additional interim wells (T-1 and T-2) have been constructed downgradient of Cell 1B. Three additional interim wells (T-3, T-4, and T-5) shall be constructed prior to the construction of the Biosolids Management Facility and/or Cells 8A and 8B at the approximate locations shown on Attachment C.

MW-2 shall be transferred to the detection monitoring program because as the landfill has expanded eastward, waste has been placed in a Unit located adjacent to MW-2. While there are no indications of impacts to MW-2, its location is now cross-gradient and/or downgradient from waste rather than upgradient. Background monitoring well MW-3 shall be re-assigned as a detection monitoring well as the landfill expands to the east and Cells 3A and Cell 3B are constructed. Any additional monitoring wells constructed at the site as new cells are constructed shall be added to the monitoring network.

The Discharger shall determine the groundwater flow rate and direction in the uppermost aquifer and in any zones of perched water and in any additional zone of saturation monitored pursuant to this Monitoring and Reporting Program, and report the results semi-annually, including the times of highest and lowest elevations of the water levels in the wells and piezometers.

Hydrographs of each well shall be submitted showing the elevation of groundwater with respect to the elevations of the top and bottom of the screened interval and the elevation of the pump intake. Hydrographs of each well shall be prepared quarterly and submitted annually.

Groundwater samples shall be collected from the point-of-compliance wells, background wells, piezometers, and any additional wells added as part of the approved groundwater monitoring system. Samples shall be collected and analyzed for the monitoring parameters in accordance with the methods and frequency specified in Tables I-A and I-B.

The monitoring parameters shall also be evaluated each reporting period with regards to the cation/anion balance, and the results shall be graphically presented using a Stiff diagram, a Piper graph, or a Schueller plot. Samples for the constituents of concern specified in Tables I-A and 1-B shall be collected and analyzed in accordance with the methods listed in Table IX every five years.

The last 5-year Constituent-of-Concern (COC) groundwater monitoring event was conducted during the fourth quarter of 2006; therefore, the next COC event is scheduled to take place in the fourth quarter of the year 2011.

2. Unsaturated Zone Monitoring

The Discharger shall operate and maintain an unsaturated zone detection monitoring system that complies with the applicable provisions of Title 27 CCR Sections 20415 and 20420 in accordance with an approved Detection Monitoring Program. The Discharger shall collect, preserve, and transport samples in accordance with the quality assurance/quality control standards contained in an approved Sample Collection and Analysis Plan.

Unsaturated zone samples shall be collected from the monitoring devices of the approved unsaturated zone monitoring system (Attachment C) and any other pan lysimeters or other unsaturated zone monitoring points installed as the additional landfill modules are constructed. The unsaturated zone monitoring points consist of background suction lysimeter VZ-1, detection monitoring point PL-2B, corrective action monitoring suction lysimeter VZ-2 (located beneath the clay liner which underlies PL-1A), and corrective action monitoring PL-1A, PL-2A, and PL-1B. Collected samples shall be analyzed for the listed constituents in accordance with the methods and frequency specified in Table II. All monitoring parameters shall be graphed annually so as to show historical trends at each monitoring point. Samples for the constituents of concern specified in Table II shall be collected and analyzed in accordance with the methods listed in Table VIII every five years.

Pan lysimeters shall be checked monthly for liquid and monitoring shall also include the total volume of liquid removed from the system. Unsaturated zone monitoring reports shall be included with the corresponding semiannual groundwater monitoring and shall include an evaluation of potential impacts of the facility on the unsaturated zone and compliance with the Water Quality Protection Standard.

The last 5-year Constituent-of-Concern (COC) vadose zone monitoring event was conducted during the fourth quarter of 2006; therefore, the next COC event is scheduled to take place in the fourth quarter of the year 2011.

Land Treatment Unit (LTU)

Unsaturated zone monitoring of the LTU shall be conducted in accordance with Title 27 CCR Section 20435. LTU monitoring will be conducted by installing one soil boring per acre of the (10.5-acre) LTU area. Background borings to be installed at the beginning of the drying season (prior to application of sludge). Detection borings to be installed at end of drying season (after sludge is removed) immediately beneath the treatment zone (no deeper than 6 feet below ground surface as described in the RWD/JTD). Samples shall be analyzed in accordance with Tables II-B and II-C.

3. Gas Monitoring

Perimeter probes, leak detection sumps, and pan lysimeters shall be monitored as a part of the unsaturated zone landfill gas detection monitoring program on a quarterly basis for the presence of methane, carbon dioxide, and oxygen using field instrumentation (Table III). If methane is detected with a gas meter in a perimeter probe, pan lysimeter, or leak detection sump at a concentration greater than 1.0 percent AND organic vapors are detected with a photoionization detector (PID) at a concentration greater than 1.0 part per million (ppm), then a gas sample shall be obtained and analyzed for specific VOCs using EPA Method TO-15 (Table III). The PID monitoring for VOCs shall be conducted with calibration to a hexane standard or other straight-chain, fuel-related hydrocarbon. Conversion to benzene-equivalents shall be conducted using a response factor for benzene provided by the manufacturer. Gas control measures shall be implemented for a Class II module upon the detection of gas-phase concentrations of VOCs as specified in Facility Specification C.15 of WDRs Order No. R5-2009-_____.

The Discharger shall conduct verification testing (see Detection Monitoring Specification E.20.b in WDRs Order No. R5-2009-_____) if the data meet either of the trigger conditions of Detection Monitoring Specifications E.20. in WDRs Order No. R5-2009-_____ to determine whether a release of VOCs has occurred.

4. Leachate Monitoring/Seeps

Leachate collection sumps include Sump 1-A, Sump 1-B, Sump 2A (also referred to as Sump 2.1), Sump 2-B (also referred to as Sump 2.3) and any other sump installed as the additional landfill modules are constructed. All Unit leachate collection and removal system sumps shall be inspected **monthly** for leachate generation. Upon detection of leachate in a previously dry leachate collection and removal system, leachate shall be sampled **immediately** and analyzed for the constituents listed in Table IV. Leachate shall then be sampled and analyzed annually during the fourth quarter thereafter, with a retest during the following second quarter if constituents are detected that have not been previously detected. Leachate samples shall be collected and analyzed for the listed constituents in accordance with the methods and frequency specified in Table IV. The constituents of concern list shall include all constituents listed in Table IX. The quantity of leachate pumped from each sump shall be measured and reported monthly as Leachate Flow Rate (in gallons).

Leachate which seeps to the surface from the Unit and extends out of any Unit, shall be sampled and analyzed for the Monitoring Parameters and Constituents of Concern listed in Table IV upon detection. The quantity of leachate shall be *estimated* and reported as Leachate Flow Rate (in gallons/day). Also, refer to Section E.4, below.

5. Leak Detection Monitoring

Leak detection layer sumps include LD-1B, LD-2B, LD-Cell 2 Phase 4, LD-Cell

3 Phase 1 (North) and LD-Cell 3 Phase 1 (South) and any other leak detection layer sumps added as the additional landfill modules are constructed. Leak detection layer sumps in the double liner systems shall be checked **semi-annually** for the presence of liquid and the Discharger shall notify the Regional Water Board within **one week** if liquid has been observed. Liquid samples shall be analyzed for Total Dissolved Solids (TDS), chloride and bicarbonate (Table V) to determine the origin of the liquid. If sampling indicates evidence of a release, then confirmation activities described in Detection Monitoring Specifications E.21 and Title 27 Section 20420(j) shall be performed. All remaining liquid shall be pumped out of the leak detection layer within 48 hours.

The leak detection layer shall be monitored in accordance with Table V and the LFG monitoring specified in Section D.3.

6. Surface Water Monitoring

The Discharger shall maintain an approved surface water detection monitoring system where appropriate that complies with the applicable provisions of Title 27 CCR Sections 20415 and 20420 in accordance with an approved Detection Monitoring Program.

For all monitoring points assigned to surface water detection monitoring, samples shall be collected and analyzed for the monitoring parameters in accordance with the methods and frequency specified in Table VI. The surface water monitoring points shall consist of SW-1 and SW-3 (Attachment C).

As the site is located on relatively flat topography, surface water run-on to the site from adjacent roads and agricultural fields is limited. Most surface water run-off results from precipitation on covered portions of the landfill and this run-off is routed to sedimentation basins. When water accumulates in the sedimentation basins and is settled, the water is pumped into drainage ditches that flow to the southern boundary of the site, which eventually discharges to Best Slough. Surface water locations SW-1 (upgradient) and SW-3 (downgradient) in Best Slough shall be sampled annually during the first storm event of the rainy season that requires discharge (pumping) from the sites sedimentation basins. Precipitation or run-off that comes in contact with an active area of the landfill containing waste shall be directed to the LCRS using earthen berms and drains constructed in the operations layer.

All surface water monitoring samples shall be collected and analyzed for the constituents of concern specified in Table IX every five years. All monitoring parameters shall be graphed annually so as to show historical trends at each sample location.

Surface water samples shall also be collected when leachate seeps are observed that may have impacted surface water quality. If leachate seeps are identified extending out of the disposal area or that potentially impact on-site drainages, those drainages shall be sampled as close to the leachate as possible.

The last 5-year Constituent-of-Concern (COC) surface water monitoring event was conducted during the fourth quarter of 2006; however, no surface water sample was collected as no discharge from the sedimentation basins was occurring. Analysis for 5-year COCs occurred in first quarter 2007 when flow was present. The next COC event is scheduled to take place in the fourth quarter of the year 2011.

7. Storm Water Monitoring

Storm water monitoring shall be conducted in accordance with the NPDES General Permit for Storm Water Discharges Associated with Industrial Activities (Water Quality Order No. 97-03-DWG, NPDES No. CAS000001). The Discharger shall submit a copy of the storm water Annual Report with the first semi-annual monitoring report for each year submitted under this program.

8. Semi-Solid Waste Monitoring

Semi-solid wastes discharged to the waste pile and LTU shall be monitored in accordance to the parameters and frequency specified in Table VII.

9. Facility Monitoring

a. Facility Inspection

Annually, prior to the anticipated rainy season, but no later than **15 August**, the Discharger shall conduct an inspection of the facility. The inspection shall assess damage to the drainage control system, groundwater monitoring equipment (including wells, etc.). By **15 September of each year**, the Discharger shall submit to the Regional Water Board a Winterization Plan describing measures planned to prepare the site and conduct operations during the wet season.

Any necessary erosion control measures shall be implemented, and any necessary construction, maintenance, or repairs of precipitation and drainage control facilities shall be completed to prevent erosion or flooding of the facility and to prevent surface drainage from contacting or percolating through wastes by **15 October**. The Discharger shall submit an Annual Winterization Report (AWR) to the Regional Water Board describing the results of the inspection, implementation of the Winterization Plan, and measures taken to comply with this specification report, including photographs of the problem and the repairs. The AWR may be included in the Annual Report submitted under Monitoring and Reporting Program No. R5-2009-_____.

b. Storm Events

The Discharger shall inspect all precipitation, diversion, and drainage facilities for damage **within 7 days** following *major storm events*. Necessary interim repairs shall be completed **within 10 days** of the inspection and permanent repairs shall be completed when feasible. The Discharger shall report any damage and subsequent repairs within 45 days of completion of the repairs, including photographs of the problem and the repairs.

c. Standard Observations

Each monitoring report shall include a summary and certification of completion of all Standard Observations for the waste management unit, for the perimeter of the landfill module, and for the receiving waters. The standard observations shall include those elements identified in Section E.3.f, below, and shall be performed at the required frequencies.

E. REPORTING REQUIREMENTS

1. The Discharger shall retain records of all monitoring information, including all calibration and maintenance records, all original strip chart recordings of continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order. Records shall be maintained throughout the life of the facility including the post closure period.

Such legible records shall show the following for each sample:

- a. Sample identification and the monitoring point or background monitoring point from which it was taken, along with the identity of the individual who obtained the sample;
 - b. Date, time, and manner of sampling;
 - c. Date and time that analyses were started and completed, and the name of the personnel and laboratory performing each analysis;
 - d. Complete procedure used, including method of preserving the sample, and the identity and volumes of reagents used;
 - e. Calculation of results; and
 - f. Results of analyses, and the MDL and PQL for each analysis.
2. A transmittal letter explaining the essential points shall accompany each report. At a minimum, the transmittal letter shall identify any violations found since the last report was submitted, and if the violations were corrected. If no violations have occurred since the last submittal, this shall be stated in the transmittal letter. The transmittal letter shall also state that a discussion of any violations found since the last report was

submitted, and a description of the actions taken or planned for correcting those violations, including any references to previously submitted time schedules, is contained in the accompanying report.

3. Each monitoring report shall include a compliance evaluation summary. The summary shall contain at least:
 - a. For each monitoring point and background monitoring point addressed by the report, a description of:
 - 1) The time of water level measurement;
 - 2) The type of pump - or other device - used for purging and the elevation of the pump intake relative to the elevation of the screened interval;
 - 3) The method of purging (the pumping rate; the equipment and methods used to monitor field pH, temperature, and conductivity during purging; the calibration of the field equipment; results of the pH, temperature, conductivity, and turbidity testing; and the method of disposing of the purge water) to remove all portions of the water that was in the well bore while the sample was being taken;
 - 4) The type of pump - or other device - used for sampling, if different than the pump or device used for purging; and
 - 5) A statement that the sampling procedure was conducted in accordance with the approved Sample Collection and Analysis Plan.
 - b. A map or aerial photograph showing the locations of observation stations, monitoring points, and background monitoring points.
 - c. For each groundwater body, a description and graphical presentation of the gradient and direction of groundwater flow under/around the Unit, and the groundwater flow rate, based upon water level elevations taken prior to the collection of the water quality data submitted in the report.
 - d. Laboratory statements of results of all analyses evaluating compliance with requirements.
 - e. An evaluation of the effectiveness of the leachate monitoring and control facilities, and of the run-off/run-on control facilities.
 - f. A summary and certification of completion of all **Standard Observations** for the Unit(s), for the perimeter of the Unit, and for the receiving waters. Standard observations for ACTIVE landfill units shall be conducted **weekly** during the wet season (1 October to 30 April) and **monthly** during the dry season (1 May to 30 September). Standard observations for INACTIVE or CLOSED landfill units shall be conducted **monthly** during the wet season (1 October to 30 April) and

quarterly during the dry season (1 May to 30 September). The Standard Observations shall include:

- 1) For the Unit:
 - a) Evidence of ponded water at any point on the facility (show affected area on map);
 - b) Evidence of odors - presence or absence, characterization, source, and distance of travel from source; and
 - c) Evidence of erosion and/or of day-lighted refuse.
- 2) Along the perimeter of the Unit:
 - a) Evidence of liquid leaving or entering the Unit, estimated size of affected area, and flow rate (show affected area on map);
 - b) Evidence of odors - presence or absence, characterization, source, and distance of travel from source; and
 - c) Evidence of erosion and/or of day-lighted refuse.
- 3) For receiving waters:
 - a) Floating and suspended materials of waste origin - presence or absence, source, and size of affected area;
 - b) Discoloration and turbidity - description of color, source, and size of affected area;
 - c) Evidence of odors - presence or absence, characterization, source, and distance of travel from source;
 - d) Evidence of water uses - presence of water-associated wildlife;
 - e) Flow rate; and
 - f) Weather conditions - wind direction and estimated velocity, total precipitation during recent days and on the day of observation.
- g. The quantity and types of wastes discharged and the locations in the Unit where waste has been placed since submittal of the last such report.
4. The Discharger shall report by telephone any seepage from the disposal area **immediately** after it is discovered. A written report shall be filed with the Regional Water Board **within seven days**, containing at least the following information:
 - a. A map showing the location(s) of seepage;

- b. An estimate of the flow rate;
 - c. A description of the nature of the discharge (e.g., all pertinent observations and analyses);
 - d. Verification that samples have been submitted for analyses of the Constituents of Concern and Monitoring Parameters, and an estimated date that the results will be submitted to the Regional Water Board; and
 - e. Corrective measures underway or proposed, and corresponding time schedule.
5. The Discharger shall submit an **Annual Monitoring Summary Report** to the Regional Water Board covering the reporting period of the previous monitoring year. This report shall contain:
- a. All monitoring parameters and constituents of concern shall be graphed so as to show historical trends at each monitoring point and background monitoring point, for all samples taken within at least the previous five calendar years. Each such graph shall plot the concentration of one or more constituents for the period of record for a given monitoring point or background monitoring point, at a scale appropriate to show trends or variations in water quality. The graphs shall plot each datum, rather than plotting mean values. For any given constituent or parameter, the scale for background plots shall be the same as that used to plot down-gradient data. Graphical analysis of monitoring data may be used to provide significant evidence of a release.
 - b. Unless otherwise exempted, all monitoring analytical data obtained during the previous two six-month reporting periods, shall be submitted in tabular form as well as in a digital file format. The Regional Water Board regards the submittal of data in hard copy and in digital format as "...the form necessary for..." statistical analysis [§20420(h)], in that this facilitates periodic review by the Regional Water Board.
 - c. A comprehensive discussion of the compliance record, and the result of any corrective actions taken or planned which may be needed to bring the Discharger into full compliance with the waste discharge requirements.
 - d. A map showing the area and elevations in which filling has been completed during the previous calendar year and a comparison to final closure design contours.
 - e. A written summary of the monitoring results, indicating any changes made or observed since the previous annual report.
 - f. An evaluation of the effectiveness of the leachate monitoring/control facilities, including the results of the annual testing of leachate collection and removal systems required under VIII.P of the Standard Provisions and Reporting Requirements.

6. The Discharger shall submit a report on the effectiveness of the corrective action program in accordance with Title 27 CCR Section 20430(h) to the Regional Water Board semi-annually. This report may be included in the Semi-Annual Monitoring Report submitted under Monitoring and Reporting Program No. R5-2009-_____.
7. Annually, prior to the anticipated rainy season but no later than **15 October**, any necessary erosion control measures shall be implemented, and any necessary construction, maintenance, or repairs of precipitation and drainage control facilities shall be completed to prevent erosion or flooding of the facility and to prevent surface drainage from contacting or percolating through wastes. By **15 September of each year**, the Discharger shall submit to the Board a Winterization Plan describing measures planned to prepare the site and conduct operations during the wet season. The Discharger shall submit an Annual Winterization Report (AWR) to the Regional Water Board describing implementation of the Winterization Plan and measures taken to comply with this specification. The AWR may be included in the Annual Report submitted under Monitoring and Reporting Program No. R5-2009-_____.

Ordered by: _____
PAMELA C. CREEDON, Executive Officer

(Date)

JSH

TABLE I-A
GROUNDWATER BACKGROUND AND DETECTION MONITORING PROGRAM

<u>Parameter</u>	<u>Units</u>	<u>Frequency*</u>
Field Parameters		
Groundwater Elevation	Ft. & hundredths, M.S.L.	Quarterly
Temperature	°C	Semi-Annual
Electrical Conductivity	µmhos/cm	Semi-Annual
pH	pH units	Semi-Annual
Turbidity	Turbidity units	Semi-Annual
Monitoring Parameters		
Total Dissolved Solids (TDS)	mg/L	Semi-Annual
Chloride	mg/L	Semi-Annual
Carbonate	mg/L	Semi-Annual
Bicarbonate	mg/L	Semi-Annual
Nitrate - Nitrogen	mg/L	Semi-Annual
Sulfate	mg/L	Semi-Annual
Calcium ¹	mg/L	Semi-Annual
Magnesium ¹	mg/L	Semi-Annual
Potassium ¹	mg/L	Semi-Annual
Sodium ¹	mg/L	Semi-Annual
Volatile Organic Compounds (USEPA Method 8260, see Table VII)	µg/L	Semi-Annual
Ammonia ²	mg/L	Semi-Annual
Nitrite – Nitrogen ²	mg/L	Semi-Annual
Total Kjeldahl Nitrogen ²	mg/L	Semi-Annual
Constituents of Concern (see Table VIII)		
Total Organic Carbon	mg/L	5 years
Fecal Coliform ²	100 mpn/100ml	5 years
Inorganics (dissolved)	mg/L	5 years
Volatile Organic Compounds (USEPA Method 8260B, extended list)	µg/L	5 years
Semi-Volatile Organic Compounds (USEPA Method 8270C)	µg/L	5 years
Chlorophenoxy Herbicides (USEPA Method 8151A)	µg/L	5 years
Organophosphorus Compounds (USEPA Method 8141A)	µg/L	5 years

1. Concentration limits are not required for these constituents.

2. Monitoring parameters for Biosolids Management Facility monitoring wells.

TABLE I-B
GROUNDWATER CORRECTIVE ACTION PIEZOMETERS MONITORING PROGRAM

<u>Parameter</u>	<u>Units</u>	<u>Frequency*</u>
Field Parameters		
Groundwater Elevation	Ft. & hundredths, M.S.L.	Quarterly
Temperature	°C	Quarterly
Electrical Conductivity	µmhos/cm	Quarterly
pH	pH units	Quarterly
Turbidity	Turbidity units	Quarterly
Monitoring Parameters		
Total Dissolved Solids (TDS)	mg/L	Quarterly
Chloride	mg/L	Quarterly
Carbonate	mg/L	Quarterly
Bicarbonate	mg/L	Quarterly
Nitrate - Nitrogen	mg/L	Quarterly
Sulfate	mg/L	Quarterly
Calcium ¹	mg/L	Quarterly
Magnesium ¹	mg/L	Quarterly
Potassium ¹	mg/L	Quarterly
Sodium ¹	mg/L	Quarterly
Volatile Organic Compounds (USEPA Method 8260, see Table VII)	µg/L	Quarterly
Constituents of Concern (see Table VIII)		
Total Organic Carbon	mg/L	5 years
Inorganics (dissolved)	mg/L	5 years
Volatile Organic Compounds (USEPA Method 8260B, extended list)	µg/L	5 years
Semi-Volatile Organic Compounds (USEPA Method 8270C)	µg/L	5 years
Chlorophenoxy Herbicides (USEPA Method 8151A)	µg/L	5 years
Organophosphorus Compounds (USEPA Method 8141A)	µg/L	5 years

1. Concentration limits are not required for these constituents.

TABLE II-A
UNSATURATED ZONE MONITORING PROGRAM

<u>Parameter</u>	<u>Units</u>	<u>Frequency*</u>
Field Parameters		
Electrical Conductivity	µmhos/cm	Semi-Annual
pH	pH units	Semi-Annual
Monitoring Parameters		
Total Dissolved Solids (TDS)	mg/L	Semi-Annual
Chloride	mg/L	Semi-Annual
Carbonate	mg/L	Semi-Annual
Bicarbonate	mg/L	Semi-Annual
Nitrate - Nitrogen	mg/L	Semi-Annual
Sulfate	mg/L	Semi-Annual
Calcium ¹	mg/L	Semi-Annual
Magnesium ¹	mg/L	Semi-Annual
Potassium ¹	mg/L	Semi-Annual
Sodium ¹	mg/L	Semi-Annual
Volatile Organic Compounds (USEPA Method 8260B, see Table VII)	µg/L	Semi-Annual
Constituents of Concern (see Table VIII)		
Total Organic Carbon	mg/L	5 years
Inorganics (dissolved)	mg/L	5 years
Volatile Organic Compounds (USEPA Method 8260B, extended list)	µg/L	5 years
Semi-Volatile Organic Compounds (USEPA Method 8270C)	µg/L	5 years
Chlorophenoxy Herbicides (USEPA Method 8151A)	µg/L	5 years
Organophosphorus Compounds (USEPA Method 8141A)	µg/L	5 years

1. Concentration limits are not required for these constituents.

TABLE II-B
UNSATURATED ZONE MONITORING PROGRAM
LAND TREATMENT UNIT – Soil Pore Water¹

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>
Field Parameters		
pH	pH units	Twice per year ¹
Monitoring Parameters		
Total Dissolved Solids	mg/L	Twice per year ²
Chloride	mg/L	Twice per year ²
Ammonia	mg/L	Twice per year ²
Nitrate	mg/L	Twice per year ²
Nitrite	mg/L	Twice per year ²
Sulfate	mg/L	Twice per year ²
Total Kjeldahl Nitrogen	mg/L	Twice per year ²
Volatile Organic Compounds (USEPA Method 8260B, extended list)	ug/L	Twice per year ²
Constituents of Concern		
Metals ³	mg/L	5 years
Fecal coliform	mg/L	5 years
Total Organic Carbon	mg/L	5 years
Semi-volatile organic compounds	ug/L	5 years
Organophosphorus pesticides	ug/L	5 years
Chlorinated herbicides	ug/L	5 years
PCBs	ug/L	5 years

Notes:

1. If pore water cannot be extracted from samples, proceed with soil analysis per Table II-C-2.
2. One sample shall be taken at each monitoring location before the drying season (prior to sludge application) and one at the end of the drying season (after sludge is removed).

TABLE II-C
UNSATURATED ZONE MONITORING PROGRAM
LAND TREATMENT UNIT - Soil

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>
Field Parameters		
Moisture	percent	Twice per year ¹
pH	pH units	Twice per year ¹
Monitoring Parameters		
Chloride	mg/L	Twice per year ²
Ammonia	mg/L	Twice per year ²
Nitrate	mg/L	Twice per year ²
Nitrite	mg/L	Twice per year ²
Sulfate	mg/L	Twice per year ²
Total Kjeldahl Nitrogen	mg/L	Twice per year ²
Volatile Organic Compounds (USEPA Method 8260B, extended list)	ug/L	Twice per year ²
Constituents of Concern		
Metals ³	mg/L	5 Years
Fecal coliform	mg/L	5 Years
Total Organic Carbon	mg/L	5 Years
Semi-volatile organic compounds	ug/L	5 Years
Organophosphorus pesticides	ug/L	5 Years
Chlorinated herbicides	ug/L	5 Years
PCBs	ug/L	5 Years

Notes:

1. One sample shall be taken at each monitoring location before the drying season (prior to sludge application) and one at the end of the drying season (after sludge is removed).
2. Samples shall be taken at end of drying season after sludge removal immediately below the treatment zone of 5 feet but not to exceed 6 feet in depth. Monitor soil for these constituents only when pore water samples cannot be extracted from soil. Use WET test for extraction and see Table IX for constituent test methods.
3. Metals (Ag, Al, As, Ba, Be, Cd, Cr, Co, Cu, Fe, Hg, Pb, Ni, Sb, Se, Ti, V, Zn).

TABLE III
GAS MONITORING PROGRAM

Landfill Gas Detection Monitoring Program

Location	Landfill Gas Monitoring Parameters				VOCs By
	Methane	Carbon Dioxide	Oxygen	Organic vapors	EPA TO-15
All perimeter probes, leak detection sumps, and pan lysimeters.	Quarterly	Quarterly	Quarterly	Quarterly	If detected*
LFG Field Monitoring using GEM 500 (or approved equivalent) for LFG and portable Photo Ionization Detector (PID) Meter for VOCs. The PID shall be calibrated and results presented as benzene equivalents. * If methane is detected with a gas meter at a concentration greater than 1.0 percent by volume AND organic vapors are detected with a PID at a concentration greater than 1.0 ppm, then a gas sample shall be obtained and analyzed for specific VOCs using EPA Method TO-15 (Table V).					

TABLE IV
LEACHATE/SEEP DETECTION MONITORING PROGRAM

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>
Field Parameters		
Total Flow	Gallons	Weekly
Flow Rate	Gallons/Day	Weekly
Electrical Conductivity	µmhos/cm	Annually
pH	pH units	Annually
Monitoring Parameters		
Total Dissolved Solids (TDS)	mg/L	Annually
Chloride	mg/L	Annually
Carbonate	mg/L	Annually
Bicarbonate	mg/L	Annually
Nitrate - Nitrogen	mg/L	Annually
Sulfate	mg/L	Annually
Calcium	mg/L	Annually
Magnesium	mg/L	Annually
Potassium	mg/L	Annually
Sodium	mg/L	Annually
Volatile Organic Compounds (USEPA Method 8260B, see Table VII)	µg/L	Annually
Constituents of Concern (see Table VIII)		
Total Organic Carbon	mg/L	5 years
Inorganics (dissolved)	mg/L	5 years
Volatile Organic Compounds (USEPA Method 8260B, extended list)	µg/L	5 years
Semi-Volatile Organic Compounds (USEPA Method 8270C)	µg/L	5 years
Chlorophenoxy Herbicides (USEPA Method 8151A)	µg/L	5 years
Organophosphorus Compounds (USEPA Method 8141A)	µg/L	5 years

TABLE V
LEAK DETECTION MONITORING
(Semi-Annually)

Location	Liquid Analysis (if present)
All leak detection layer sumps	Total Dissolved Solids
	Chloride
	Bicarbonate

* For LFG portion of the leak detection monitoring refer to Table III.

TABLE VI
SURFACE WATER DETECTION MONITORING PROGRAM

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u> *
Field Parameters		
Temperature	°C	Annually
Electrical Conductivity	µmhos/cm	Annually
pH	pH units	Annually
Monitoring Parameters		
Total Dissolved Solids (TDS)	mg/L	Annually
Bicarbonate Alkalinity	mg/L	Annually
Chloride	mg/L	Annually
Nitrate as Nitrogen	mg/L	Annually
Volatile Organic Compounds (USEPA Method 8260B, see Table VII)	µg/L	Annually
Constituents of Concern (see Table VIII)		
Inorganics (dissolved)	mg/L	5 years
Volatile Organic Compounds (USEPA Method 8260B, extended list)	µg/L	5 years
Semi-Volatile Organic Compounds (USEPA Method 8270C)	µg/L	5 years
Chlorophenoxy Herbicides (USEPA Method 8151A)	µg/L	5 years
Organophosphorus Compounds (USEPA Method 8141A)	µg/L	5 years

* Surface water samples shall be collected during the first storm that produces runoff and when leachate seeps are observed that may have impacted surface water quality. If leachate seeps are identified extending out of the disposal area or that potentially impact on-site drainages, those drainages shall be sampled as close to the leachate as possible.

TABLE VII
SEMISOLID WASTE MONITORING PROGRAM

Waste Pile

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>
Type of material discharged	-----	Semi-Annual
Quantity discharged	cubic yards, wet tons	Semi-Annual
Moisture Content ¹	percent	Semi-Annual
Capacity of unit/module remaining	percent	Semi-Annual

1. Biosolids discharged to the surface impoundment(s) shall not contain any free liquids per Prohibition A.11 of WDRs.

Land Treatment Unit

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>
Initial sludge depth	inches and # of lifts	Monthly
Quantity discharged	cubic yards, wet tons	Monthly
Moisture Content	percent	Monthly
Location within LTU	quadrant	Monthly
Quantity removed	cubic yards, wet tons	Monthly
Moisture content	percent	Monthly
Location within LTU	quadrant	Monthly
Disposition	-----	Monthly
Final sludge depth	inches and # of lifts	Monthly
Area covered	acres	Monthly
Total drying cycles during period	-----	Monthly
Cumulative LTU area covered	acres	Monthly

TABLE VIII

MONITORING PARAMETERS FOR DETECTION MONITORING

Surrogates for Metallic Constituents:

pH
Total Dissolved Solids
Electrical Conductivity
Chloride
Sulfate
Nitrate nitrogen

Constituents included in VOC:

USEPA Method 8260B

Acetone
Acrylonitrile
Tert-Amyl ethyl ether
Benzene
Bromobenzene
Bromochloromethane
Bromodichloromethane
Bromoform (Tribromomethane)
n-Butylbenzene
sec-Butylbenzene
tert-Butylbenzene
Carbon disulfide
Carbon tetrachloride
Chlorobenzene
Chloroethane (Ethyl chloride)
Chloroform (Trichloromethane)
Dibromochloromethane (Chlorodibromomethane)
1,2-Dibromo-3-chloropropane (DBCP)
1,2-Dibromoethane (Ethylene dibromide; EDB)
o-Dichlorobenzene (1,2-Dichlorobenzene)
m-Dichlorobenzene (1,3-Dichlorobenzene)
p-Dichlorobenzene (1,4-Dichlorobenzene)
trans-1,4-Dichloro-2-butene
Dichlorodifluoromethane (CFC-12)
1,1-Dichloroethane (Ethylidene chloride)
1,2-Dichloroethane (Ethylene dichloride)
1,1 -Dichloroethylene (1,1 -Dichloroethene; Vinylidene chloride)
cis- 1,2-Dichloroethylene (cis- 1,2-Dichloroethene)
trans-1,2-Dichloroethylene (trans-1,2-Dichloroethene)
1,2-Dichloropropane (Propylene dichloride)
cis- 1,3-Dichloropropene
trans- 1,3-Dichloropropene
Di-isopropylether (DIPE)
1,4 Dioxane
Ethanol

TABLE VIII

MONITORING PARAMETERS FOR DETECTION MONITORING

Continued

di-Isopropyl ether
Ethyltertiary butyl ether
Ethylbenzene
2-Hexanone (Methyl butyl ketone)
Hexachlorobutadiene
Hexachloroethane
Methyl bromide (Bromomethene)
Methyl chloride (Chloromethane)
Methylene bromide (Dibromomethane)
Methylene chloride (Dichloromethane)
Methyl ethyl ketone (MEK: 2-Butanone)
Methyl iodide (Iodomethane)
Methyl t-butyl ether
4-Methyl-2-pentanone (Methyl isobutylketone)
Naphthalene
2-Nitropropane
n-Propylbenzene
Styrene
Tertiary amyl methyl ether
Tertiary butyl alcohol
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
Tetrachloroethylene (Tetrachloroethene; Perchloroethylene)
Toluene
1,2,4-Trichlorobenzene
1,1,1-Trichloroethane (Methylchloroform)
1,1,2-Trichloroethane
Trichloroethylene (Trichloroethene)
Trichlorofluoromethane (CFC- 11)
1,2,3-Trichloropropane
1,2,4-Trimethylbenzene
1,3,5-Trimethylbenzene
Vinyl acetate
Vinyl chloride
Xylenes (total)

TABLE IX
CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS

<u>Inorganics (dissolved):</u>	<u>USEPA Method</u>
Aluminum	6010
Antimony	7041
Barium	6010
Beryllium	6010
Cadmium	7131A
Chromium	6010
Cobalt	6010
Copper	6010
Silver	6010
Tin	6010
Vanadium	6010
Zinc	6010
Iron	6010
Manganese	6010
Arsenic	7062
Lead	7421
Mercury	7470A
Nickel	7521
Selenium	7742
Thallium	7841
Cyanide	9010B
Sulfide	9030B

Volatile Organic Compounds:

USEPA Method 8260

Acetone
 Acetonitrile (Methyl cyanide)
 Acrolein
 Acrylonitrile
 Allyl chloride (3-Chloropropene)
 Tert-Amyl ethyl ether
 Benzene
 Bromobenzene
 Bromochloromethane (Chlorobromomethane)
 Bromodichloromethane (Dibromochloromethane)
 Bromoform (Tribromomethane)
 n-Butylbenzene
 sec-Butylbenzene
 tert-Butylbenzene
 Carbon disulfide
 Carbon tetrachloride
 Chlorobenzene
 Chloroethane (Ethyl chloride)
 Chloroform (Trichloromethane)
 Chloroprene
 Dibromochloromethane (Chlorodibromomethane)
 1,2-Dibromo-3-chloropropane (DBCP)

TABLE IX

CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS
Continued

1,2-Dibromoethane (Ethylene dibromide; EDB)
o-Dichlorobenzene (1,2-Dichlorobenzene)
m-Dichlorobenzene (1,3-Dichlorobenzene)
p-Dichlorobenzene (1,4-Dichlorobenzene)
trans- 1,4-Dichloro-2-butene
Dichlorodifluoromethane (CFC 12)
1,1 -Dichloroethane (Ethylidene chloride)
1,2-Dichloroethane (Ethylene dichloride)
1,1 -Dichloroethylene (1, 1-Dichloroethene; Vinylidene chloride)
cis- 1,2-Dichloroethylene (cis- 1,2-Dichloroethene)
trans- 1,2-Dichloroethylene (trans- 1,2-Dichloroethene)
1,2-Dichloropropane (Propylene dichloride)
1,3-Dichloropropane (Trimethylene dichloride)
2,2-Dichloropropane (Isopropylidene chloride)
1,1 -Dichloropropene
cis- 1,3-Dichloropropene
trans- 1,3-Dichloropropene
Di-isopropylether (DIPE)
1,4-Dioxane
Ethanol
Ethyltertiary butyl ether
Ethylbenzene
Ethyl methacrylate
Hexachlorobutadiene
Hexachloroethane
2-Hexanone (Methyl butyl ketone)
Isobutyl alcohol
Methacrylonitrile
Methyl bromide (Bromomethane)
Methyl chloride (Chloromethane)
Methyl ethyl ketone (MEK; 2-Butanone)
Methyl iodide (Iodomethane)
Methyl t-butyl ether
Methyl methacrylate
4-Methyl-2-pentanone (Methyl isobutyl ketone)
Methylene bromide (Dibromomethane)
Methylene chloride (Dichloromethane)
Naphthalene
2-Nitropropane
n-Propylbenzene
Propionitrile (Ethyl cyanide)
Styrene
Tertiary amyl methyl ether
Tertiary butyl alcohol
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
Tetrachloroethylene (Tetrachloroethene; Perchloroethylene; PCE)
Toluene

1,2,4-Trichlorobenzene

TABLE IX

CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS

Continued

1,1,1 -Trichloroethane, Methylchloroform
1,1,2-Trichloroethane
Trichloroethylene (Trichloroethene; TCE)
Trichlorofluoromethane (CFC- 11)
1,2,3-Trichloropropane
1,2,4-Trimethylbenzene
1,3,5-Trimethylbenzene
Vinyl acetate
Vinyl chloride (Chloroethene)
Xylene (total)

Semi-Volatile Organic Compounds:

USEPA Method 8270 - base, neutral, & acid extractables

Acenaphthene
Acenaphthylene
Acetophenone
2-Acetylaminofluorene (2-AAF)
Aldrin
4-Aminobiphenyl
Anthracene
Benzo[a]anthracene (Benzanthracene)
Benzo[b]fluoranthene
Benzo[k]fluoranthene
Benzo[g,h,i]perylene
Benzo[a]pyrene
Benzyl alcohol
Bis(2-ethylhexyl) phthalate
alpha-BHC
beta-BHC
delta-BHC
gamma-BHC (Lindane)
Bis(2-chloroethoxy)methane
Bis(2-chloroethyl) ether (Dichloroethyl ether)
Bis(2-chloro-1-methylethyl) ether (Bis(2-chloroisopropyl) ether; DCIP)
4-Bromophenyl phenyl ether
Butyl benzyl phthalate (Benzyl butyl phthalate)
Chlordane
p-Chloroaniline
Chlorobenzilate
p-Chloro-m-cresol (4-Chloro-3-methylphenol)
2-Chloronaphthalene
2-Chlorophenol
4-Chlorophenyl phenyl ether
Chrysene
o-Cresol (2-methylphenol)

m-Cresol (3-methylphenol)

TABLE IX

CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS

Continued

p-Cresol (4-methylphenol)
4,4'-DDD
4,4'-DDE
4,4'-DDT
Diallate
Dibenz[a,h]anthracene
Dibenzofuran
Di-n-butyl phthalate
3,3'-Dichlorobenzidine
2,4-Dichlorophenol
2,6-Dichlorophenol
Dieldrin
Diethyl phthalate
p-(Dimethylamino)azobenzene
7,12-Dimethylbenz[a]anthracene
3,3'-Dimethylbenzidine
2,4-Dimehtylphenol (m-Xylenol)
Dimethyl phthalate
m-Dinitrobenzene
4,6-Dinitro-o-cresol (4,6-Dinitro-2-methylphenol)
2,4-Dinitrophenol
2,4-Dinitrotoluene
2,6-Dinitrotoluene
Di-n-octyl phthalate
Diphenylamine
Endosulfan I
Endosulfan II
Endosulfan sulfate
Endrin
Endrin aldehyde
Ethyl methanesulfonate

TABLE IX

CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS

Continued

Famphur
Fluoranthene
Fluorene
Heptachlor
Heptachlor epoxide
Hexachlorobenzene
Hexachlorocyclopentadiene
Hexachloropropene
Indeno(1,2,3-c,d)pyrene
Isodrin
Isophorone
Isosafrole
Kepone
Methapyrilene
Methoxychlor
3-Methylcholanthrene
Methyl methanesulfonate
2-Methylnaphthalene
1,4-Naphthoquinone
1-Naphthylamine
2-Naphthylamine
o-Nitroaniline (2-Nitroaniline)
m-Nitroaniline (3-Nitroaniline)
p-Nitroaniline (4-Nitroaniline)
Nitrobenzene
o-Nitrophenol (2-Nitrophenol)
p-Nitrophenol (4-Nitrophenol)
N-Nitrosodi-n-butylamine (Di-n-butylNitrosamine)
N-Nitrosodiethylamine (DiethylNitrosamine)
N-Nitrosodimethylamine (DimethylNitrosamine)
N-Nitrosodiphenylamine (DiphenylNitrosamine)
N-Nitrosodipropylamine (N-Nitroso-N-dipropylamine; Di-n-propylNitrosamine)
N-Nitrosomethylethylamine (MethylethylNitrosamine)
N-Nitrosopiperidine
N-Nitrosopyrrolidine
5-Nitro-o-toluidine
Pentachlorobenzene
Pentachloronitrobenzene (PCNB)
Pentachlorophenol
Phenacetin
Phenanthrene
Phenol
p-Phenylenediamine
Polychlorinated biphenyls (PCBs; Aroclors)
Pronamide
Pyrene
Safrole

TABLE IX

CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS

Continued

1,2,4,5-Tetrachlorobenzene
2,3,4,6-Tetrachlorophenol
o-Toluidine
Toxaphene
2,4,5-Trichlorophenol
0,0,0-Triethyl phosphorothioate
sym-Trinitrobenzene

Chlorophenoxy Herbicides:

USEPA Method 8151A

2,4-D (2,4-Dichlorophenoxyacetic acid)
Dinoseb (DNBP; 2-sec-Butyl-4,6-dinitrophenol)
Silvex (2,4,5-Trichlorophenoxypropionic acid; 2,4,5-TP)
2,4,5-T (2,4,5-Trichlorophenoxyacetic acid)

Organophosphorus Compounds:

USEPA Method 8141A

Atrazine
Chlorpyrifos
0,0-Diethyl 0-2-pyrazinyl phosphorothioate (Thionazin)
Diazinon
Dimethoate
Disulfoton
Ethion
Methyl parathion (Parathion methyl)
Parathion
Phorate
Simazine

TABLE X- GROUNDWATER CONCENTRATION LIMITS

<u>Constituent</u>	<u>Units</u>	<u>Concentration Limit*</u>
Specific conductance	µmhos/cm	405
pH	pH Units	6.4-7.4
Total Dissolved Solids (TDS)	mg/L	310
Chloride	mg/L	14
Sulfate	mg/L	19
Nitrate-nitrite as N	mg/L	13
Total Organic Carbon	mg/L	2.7
Carbonate Alkalinity	mg/L	MDL
Bicarbonate Alkalinity	mg/L	170
Total Alkalinity	mg/L	170
VOCs (EPA 8260B)	µg/L	MDL
SVOCs (EPA 8270C)	µg/L	MDL
Chlorophenoxy Herbicides (EPA 8151A)	µg/L	MDL
Organophosphorus Compounds (EPA 8141A)	µg/L	MDL
Aluminum, dissolved	µg/L	200
Antimony, dissolved	µg/L	MDL
Arsenic, dissolved	µg/L	6.0
Barium, dissolved	µg/L	23
Beryllium, dissolved	µg/L	MDL
Cadmium, dissolved	µg/L	NE
Chromium, dissolved	µg/L	MDL
Chromium VI+, dissolved	µg/L	MDL
Cobalt, dissolved	µg/L	30
Copper, dissolved	µg/L	MDL
Cyanide, total	µg/L	510
Iron, dissolved	µg/L	NE
Lead, dissolved	µg/L	43
Manganese, dissolved	µg/L	MDL
Mercury, dissolved	µg/L	MDL
Nickel, dissolved	µg/L	MDL
Selenium, dissolved	µg/L	MDL
Silver, dissolved	µg/L	MDL
Sulfide, dissolved	µg/L	MDL
Thallium, dissolved	µg/L	MDL
Tin, dissolved	µg/L	15
Vanadium, dissolved	µg/L	30
Zinc, dissolved	µg/L	

Notes:

MDL = Laboratory Method Detection Limit

NE = Not established

* Concentration limits shall be updated as additional data is obtained. Concentration limits are not required for calcium, magnesium, potassium and sodium. They shall be evaluated each reporting period with regards to the cation/anion balance and the results shall be graphically presented using a Stiff Diagram, a Piper Diagram or a Schueller Plot.

TABLE XI- SURFACE WATER CONCENTRATION LIMITS

<u>Constituent</u>	<u>Units</u>	<u>Concentration Limit*</u>
Specific conductance	µmhos/cm	330
pH	pH Units	6.6-8.7
Total Dissolved Solids (TDS)	mg/L	250
Chloride	mg/L	12
Sulfate	mg/L	19
Nitrate-nitrite as N	mg/L	3.0
Total Organic Carbon	mg/L	13
Carbonate Alkalinity	mg/L	MDL
Bicarbonate Alkalinity	mg/L	150
Total Alkalinity	mg/L	150
VOCs (EPA 8260B)	µg/L	MDL
SVOCs (EPA 8270C)	µg/L	MDL
Chlorophenoxy Herbicides (EPA 8151A)	µg/L	MDL
Organophosphorus Compounds (EPA 8141A)	µg/L	MDL
Aluminum, dissolved	µg/L	980
Antimony, dissolved	µg/L	MDL
Arsenic, dissolved	µg/L	NE
Barium, dissolved	µg/L	30
Beryllium, dissolved	µg/L	MDL
Cadmium, dissolved	µg/L	MDL
Chromium, dissolved	µg/L	MDL
Chromium VI+, dissolved	µg/L	MDL
Cobalt, dissolved	µg/L	NE
Copper, dissolved	µg/L	MDL
Cyanide, total	µg/L	1,700
Iron, dissolved	µg/L	NE
Lead, dissolved	µg/L	110
Manganese, dissolved	µg/L	MDL
Mercury, dissolved	µg/L	MDL
Nickel, dissolved	µg/L	MDL
Selenium, dissolved	µg/L	MDL
Silver, dissolved	µg/L	MDL
Sulfide, dissolved	µg/L	MDL
Thallium, dissolved	µg/L	MDL
Tin, dissolved	µg/L	NE
Vanadium, dissolved	µg/L	NE
Zinc, dissolved	µg/L	NE

Notes:

MDL = Laboratory Method Detection Limit

NE = Not established

* Concentration limits shall be updated as additional data is obtained.

TABLE XII– UNSATURATED ZONE CONCENTRATION LIMITS
 (INCLUDES CONCENTRATION LIMITS FOR GAS-PHASE VOCs)

<u>Constituent</u>	<u>Units</u>	<u>Concentration Limit*</u>
Specific conductance	µmhos/cm	847
pH	pH Units	6.1-7.8
Total Dissolved Solids (TDS)	mg/L	690
Chloride	mg/L	4.7
Sulfate	mg/L	180
Nitrate-nitrite as N	mg/L	38
Total Organic Carbon	mg/L	NE
Carbonate Alkalinity	mg/L	MDL
Bicarbonate Alkalinity	mg/L	600
Total Alkalinity	mg/L	600
VOCs (EPA 8260B)	µg/L	MDL
VOCs-gas (EPA TO-14)	ug/L vapor or	MDL
SVOCs (EPA 8270C)	ppbv	MDL
Chlorophenoxy Herbicides (EPA 8151A)	µg/L	MDL
Organophosphorus Compounds (EPA 8141A)	µg/L	MDL
Aluminum, dissolved	µg/L	NE
Antimony, dissolved	µg/L	NE
Arsenic, dissolved	µg/L	NE
Barium, dissolved	µg/L	NE
Beryllium, dissolved	µg/L	NE
Cadmium, dissolved	µg/L	NE
Chromium, dissolved	µg/L	NE
Chromium VI+, dissolved	µg/L	NE
Cobalt, dissolved	µg/L	NE
Copper, dissolved	µg/L	NE
Cyanide, total	µg/L	NE
Iron, dissolved	µg/L	NE
Lead, dissolved	µg/L	NE
Manganese, dissolved	µg/L	NE
Mercury, dissolved	µg/L	NE
Nickel, dissolved	µg/L	NE
Selenium, dissolved	µg/L	NE
Silver, dissolved	µg/L	NE
Sulfide, dissolved	µg/L	NE
Thallium, dissolved	µg/L	NE

Tin, dissolved	µg/L	NE
Vanadium, dissolved	µg/L	NE
Zinc, dissolved	µg/L	
<p>Notes:</p> <p>MDL = Laboratory Method Detection Limit</p> <p>NE = Not established</p> <p>Ppbv = Parts per billion by volume</p> <p>* Concentration limits shall be updated as additional data is obtained. Concentration limits are not required for calcium, magnesium, potassium and sodium. They shall be evaluated each reporting period with regards to the cation/anion balance and the results shall be graphically presented using a Stiff Diagram, a Piper Diagram or a Schueller Plot.</p>		